

REMARKS

Applicant thanks the Examiner for the thorough consideration given the present application.

Claims 1-14 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the remarks as set forth below.

Drawings

The drawings have been objected to as not showing every feature specified in the claims. The Examiner points to the language "the same angle as the poles of the armature core" in claim 6 as not being seen in the drawings.

Applicant submits that claim 1 currently shows this feature. Fig. 1 shows the coil extending axially at zero degrees and the poles also extending axially at zero degrees. Thus, the same angle occurs in the coil as in the poles. For this reason, Applicant submits that the drawings show this feature of the invention.

Rejection under 35 U.S.C. § 103

Claims 1, 2, 11 and 14 stand rejected under 35 U.S.C. § 103 as being obvious over Mohr in view of Wizenetz et al. The rejection is respectfully traversed.

Claim 1, the only independent claim in the application, describes a permanent magnet direct current motor having a combination of elements including a permanent magnet stator including a permanent magnet, a rotor

having a rotor shaft, an armature core, a commutator, and a speed sensor where the sensor is a coil of conductive material fixed to the surface of the magnet and located in the air gap between the magnet and the armature core.

The Examiner points out that the Mohr reference shows a permanent magnet direct current motor with a permanent magnet stator, a rotor with a rotor shaft, an armature core, a commutator, and a speed sensor. The Examiner agrees that the reference does not show a speed sensor fixed to the surface of the magnet and located in the air gap between the magnet and the armature core.

The Examiner cited the Wizenez et al. reference to show a speed sensor fixed to the surface of the pole and located in the air gap.

Applicant disagrees with the Examiner's understanding of the Wizenez et al. reference. Applicant also disagrees with the obviousness of combining the teachings of these two references.

Applicant agrees that the Wizenez et al. reference shows a motor having a speed sensor 3. However, the speed sensor is not mounted on a magnet, but rather on an iron structure 2, since this type of the motor does not include a permanent magnet. The sensor is made of a single crystal of semiconductor materials defined at column 2, lines 55-58. Thus, this sensor does not involve a coil of conductive material nor does it involve a magnet.

Applicant submits that it would not be obvious to one having ordinary skill in the art to combine the Mohr and Wizenez et al. references and if combined, they would not meet the terms of the present application.

Mohr shows a sensing coil 12 which is mounted on the outside of the motor. This coil senses stray magnetic field changes as opposed to measuring changes in the working magnetic field of the motor. The working field is a more reliable field to sense because it is stronger than the stray field. Applicant submits that it would not be obvious to utilize the semiconductor sensor of Wizenez et al. in the Mohr device.

Wizenez et al. does not use a coil, but instead a semiconductor member arranged as a Hall device having four leads. A current is passed through the semiconductor member in proportion to the load current of the motor to generate voltage across the other electrodes to indicate the torque generated by the motor. It would not be obvious to replace the speed sensor of Mohr with such a four lead semiconductor Hall device. It also would not make sense to pass a load proportional current through the speed sensor of Mohr. Applicant submits that these two different types of sensors are not readily replaced by each other and are used for different purposes. Accordingly, Applicant submits that there would be no motivation to utilize the location of the Wizenez et al. sensor when using the coil of Mohr since the sensors involved are different

and the location is not interchangeable. For these reasons, Applicant submits that claim 1 is patentable over this combination of the references.

Claim 2 depends from claim 1 and as such is also considered to be allowable. In regard to this claim, the Examiner states that the Wizenez et al. reference also shows the conductive material made of a thin deposit of conductive ink. Applicant does not see the statement in the reference. In fact, the material of the sensor is defined in column 2, lines 55-58, as a semiconductor crystal. Accordingly, Applicant submits that claim 2 is additionally allowable.

Regarding claim 11, the Examiner states that the Wizenez et al. reference shows coil terminals on the axial end surface of the magnet. Applicant does not see this feature in the reference either. The four terminals of the semiconductor device, 4, 5, 6 and 7 are not on the end surface of the magnet. These are connected to terminals 14, 15, 16 and 17 which are described as circuit points and not assigned to any specific location. Accordingly, Applicant submits that this feature of claim 11 is not seen either.

Regarding claim 14, again, Applicant does not see the description in Wizenez et al. of the conductive ink. Accordingly, this claim is likewise considered to be allowable.

Claim 3 stands rejected under 35 U.S.C. § 103 as being obvious over Mohr in view of Wizenez et al. as applied above, and further in view of Lau.

The Examiner relies on the Lau reference to show a coil extending axially for substantially the axial length of the magnet. Applicant respectfully disagrees with this rejection.

The Lau reference is assigned to the assignee of the present application. This reference does not require the coil to extend the length of the magnet and in fact, the length of the magnet is indeterminant in Lau. Accordingly, Applicant submits that claim 3 is further allowable over this three way combination of the references.

Claims 4-10 stand rejected under 35 U.S.C. § 103 as being obvious over Mohr in view of Wizenez et al. and further in view of Jones et al. The Examiner relies on the Jones et al. reference to show various arrangements of coils as described in the claims. Applicant submits that the Jones et al. reference does not teach these features since this patent uses a length of magnetoresistive material to detect the presence of the magnet material. There is no coil of conductive materials and it is not used in an electric motor environment. Accordingly, this reference does not teach the features of a conductive coil as presently described in the claims.

Claims 12 and 13 stand rejected under 35 U.S.C. § 103 as being obvious over Mohr in view of Wizenez et al. and further in view of Tajima et al. The Examiner relies on Tajima et al. to show a motor having a deep drawn cup like housing with an end cap and the coil terminals fixed to the end cap. Applicant

submits that this reference does not teach spring biased terminals fixed to the end cap or resiliently deformable fingers extending from the end cap.

Accordingly, Applicant submits these claims are additionally allowable.

Conclusion

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination. In view of this, reconsideration of the rejections and allowance of all the claims are respectfully requested.

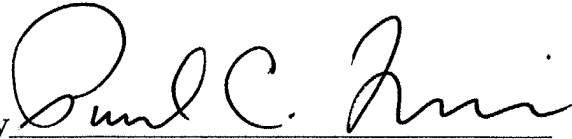
Should there be any outstanding matters which need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number of the undersigned below to conduct an interview in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/931,041
Response filed on December 26, 2002

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,


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